SECTION G:

THE CREATION OF A CITYWIDE TRAIL SYSTEM IMPLEMENTATION STRATEGIES

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Trail Implementation Process

An action group designated for the trail plan implementation should coordinate all of these following steps:

1. Preliminary Items: Environmental analysis, primary design, possible feasibility study, allocation of general construction budget – should be obtained before proceeding.
2. Permits: By City Council, possibly Fort Bend County, by all involved trail corridor owners, e.g. TxDOT, MUD's, utility and pipeline companies. Responsibility for the project construction lies primarily with the City of Sugar Land.
3. Funding: Research for necessary grant qualifications, Council approval to apply for grants or other funding sources, and ROW issues should be settled at this point.
4. Design: Preparation of construction documents, specifications and cost estimates; followed by bid documents and bidding procedures after permits and funding are clarified.
5. Physical construction of the project can now take place.

Trail Type-related Costs

General Costs are included for use in planning for trail corridors. However, general costs are always subject to change and will vary as more detailed design occurs.

General Estimated Construction Costs, for use in preliminary project feasibility determinations:

• Constructions of a new concrete trail, 10 feet wide	$400,000 to $600,000 per mile (trail and subsurface only)
• On-street trails, striping and signage	$15,000 per mile
• On-street trails, striping only	$3,500 per mile
• Widening of ROW/Shoulder (Asphalt)	$220,000 per mile
• Soft-surface trail (mulch, sand, gravel)	$170,000 per mile
• Crossing, type 1	$5,000 to $10,000 ea
• Crossing, type 1 lighted	$20,000 to $30,000 ea
• Crossing, type 2 (incl. Traffic light modification)	$20,000 to $30,000 ea
• Crossing, type 3	$100,000 to $130,000 ea
• Crossing, type 4	$200,000 to $250,000 ea

Potential Trail Funding Sources Should Include:

- Current Year 2007 bond funds for trails
- Capital Improvements and Bond Program
- Sales Tax Revenue
- Voluntary private construction as part of housing communities
- Development assessment for trail construction (as component of park dedication)
- Construction of trails as developer requirement

Funding for Trails Should Be:

- Steady and Continuous, so as to show steady improvement and interest in trail development.
- Focused on the development of major spine sections of trails, leaving construction of internal trails primarily to private development.

Funding Sources for Trail Development

Funding for trail and greenway corridor development in Sugar Land can come from a variety of sources, generated both locally and from State of Texas and federal sources. Private development of trails will also aid in the establishment of much of the future trails throughout the city.

Each trail segment will have unique funding opportunities, based on the neighborhoods around the trails and the specific characteristics of the corridor. Key issues associated with funding are as follows:

If possible, funding should be continuous and steady. Annual designations of funds for trail development will result in a steady growth in the city's trail system, and allow the citizens of Sugar Land to see the continuous flow of new trail segments every year, rather than in sporadic bursts.

Construction of major trail corridors should be the focus of public expenditures. Major "spine" segments that connect neighborhood to neighborhood should be the primary focus of public expenditures for trails. Trails within and primarily serving private developments and individual neighborhoods should be paid for with private sector funds.

Recommended Funding Sources

From an overall standpoint, the following sources of funding should serve as the primary tools for trail development in the city.

Future capital improvement or bond funds - An annual set-aside in the city's Capital Improvement Program (CIP), funded by Sugar Land 4B Corporation fund, could be used to fund trail development. These funds could be leveraged annually.

Private residential or commercial development - The majority of the trails noted in this master plan are located within residential communities or adjacent to commercial or business areas. As such, trail segments associated with both existing or new development, can be partially or entirely built by the private development community. Specific mechanisms to require trail development which can be adopted by the City Council are further discussed in this chapter.

Grants from a variety of sources - Grants that can be used for trail development are available from a variety of sources. The existing remaining bond funds provide an ideal match for grant applications. Given the compelling local issues of traffic congestion and air quality, as well as a large local population that supports alternative transportation methods, local pursuit of grants could be successful and should be aggressively pursued. Major grant types include:

Texas Parks and Wildlife Department grants - Through its outdoor recreation and community trail development grants, these matching grants can provide from $50,000 to $500,000 in grant assistance.

Federal Enhancement funds - Federal transportation dollars specifically allocated to pay for transportation enhancements have lead to the creation of over 100 miles of trails throughout Texas over the past 10 years, and have become the primary funding source for trail development in the State of Texas. These funds are administered by the Texas Department of Transportation, and as such must conform to federal guidelines for safety and for construction procurement. The locally required match is a minimum of 20%, but communities may overmatch to increase their competitive position. Funds must be reauthorized periodically by the United States Congress.

Fort Bend County park and trail development funds - For trail corridors that have regional benefits, Fort Bend County may be a future partner in developing trails.

Congestion Mitigation and Air Quality (CMAQ) grant funds - Federal dollars that assist in relieving traffic mitigation may also be used to develop trail corridors that can carry commuters to work or serve as an alternative transportation route to recreation or commercial areas.

Foundation and Company Grants - Some assist in direct funding for trail projects, and some support efforts of non-profit or citizen organizations. Further info can be found at "The Foundation Directory" and at "The Foundation Grants Index": www.fdncenter.org.

"Grants for Greenways" is a national listing that provides descriptions and links to groups who provide technical and financial support for greenway interests.

Partnering - Partnering with regional volunteer groups can also be helpful when constructing new trail projects. Their efforts can be used as part of the required match for some grants. Partnerships with Utility Companies can often be established for the proposed utility and pipeline easement trails.

Sugar Land volunteer programs, for example through schools or community groups, may substantially reduce the cost of implementing some of the proposed trail segments. Local construction companies might donate or offer discounted services, or local corporations might adopt bikeways.

Coordination with the City's Transportation Plan

Future road widening and construction projects are one means of providing bike lanes and walkways. The City's Transportation plan identifies many roadway improvements, and identifies specific roadways along which wide sidewalks or even trail segments can be built. It is essential that every opportunity for trails be used, even if a few additional feet of right of way or additional construction dollars are required. It is very difficult, and indeed in most cases impossible to retroactively build trails or acquire additional right of way once a roadway project is constructed. However, it is important that an effective review process takes place to ensure that roadway projects, where feasible, provide street-side trails, bike lanes, and sidewalks that provide true connectivity, and meet the standards and guidelines presented in this Trails Master Plan.

These are only some opportunities for implementation; other opportunities for implementation will appear during the life of this plan, and will further help to develop a true citywide trail system.

Table G - 1
Potential Funding Source Scenario for Trail Development
(Over the Next 10 Years)

Funding Type	Potential Funding Range (*)		Timeframe
	Low	Preferred	
Current Bonds Funds			
Potential Future Bond Funds (Over 10 Year Time Frame)	$2,500,000	$5,000,000	Timing of and inclusion in future bond elections to be determined.
Grants (Potential)			
TPWD	$250,000	$1,000,000	Anticipates one grant award every five years
TxDOT Enhancement Funds	$500,000	$1,000,000	Requires federal re-authorization of funding
Other local grant sources	$500,000	$750,000	Local public or semi public entities
Potential assistance from private non-profit entities	$200,000	$400,000	From organizations such as Lions, Kiwnis, Rotary, Junior League, and others
Potential private non-residential business assistance	$500,000	$1,000,000	From a variety of large employers and commercial entities in the city
Private sector residential trail development	$1,500,000	$2,500,000	For major trail segments adjacent to communities.
Total Potential Trail Funding			$6,750,000 to $12,450,000

(*) Amounts shown are used to illustrate a potentail trail funding scenario, and do not represent any actual commitment to funds.

Implementation Strategies for Development Funded Segments

The Master Plan identifies numerous trail corridors within both existing and future neighborhoods. These trail segments are extremely important as the final links from neighborhoods to the citywide trails system. Public responsibility should apply to the major trail corridors, but the implementation of much of the trail system requires the assistance, whether voluntary or mandated by ordinance, of the development community in Sugar Land. The opportunity to create a true system of trails that connects almost every neighborhood in the city can create enormous value for property and businesses in Sugar Land, but only if it is truly citywide.

Many new communities being built in Sugar Land today include internal trail systems as an integral part of their developments. Communities such as the Avalon and Commonwealth neighborhoods all have extensive trails that add to the value of those communities. These can be used as a starting model for other parts of the city.

Requirements for trails in new communities, even developments with lower cost homes, can be a key factor in speeding up the development of a citywide trails system. These requirements can either be voluntary, with the hope that all developments will include adequate trails, or mandatory and governed by city ordinances requiring trail development.

Trail Development Ordinance - Consideration of a trail development ordinance is recommended by the Trails Master Plan. Similar ordinances have been enacted in Allen and Southlake, Texas and have proven successful in helping to get trails constructed. Often, the required trails replace sidewalks, and therefore do not add significantly to the cost of the development. Credits for landscaping, pavement or other infrastructure elements can be given for trail construction. A central point to consider is that most developments will add trails automatically; therefore such a mandatory trail development ordinance only serves to create a level playing field between the many developments that include trails and those that will build them only if required to do so.

Develop Trail "Cost Sharing" ordinance revisions that require developer participation in trail development - An alternative type of ordinance can be patterned after sidewalk requirements, in which adjacent property owners fund a portion of the trail installation costs, with the City of Sugar Land covering the remainder of the cost. The alternative ordinance model, used in Allen, Texas, requires complete developer construction of key trail segments that fall within their property limits, without city participation. City funding in the second alternative is used for other regional trails or for trailhead development.

A central point to consider is that most developments will add trails automatically; therefore a mandatory trail development ordinance only serves to create a level playing field between the many developments that include trails and those that will build them only if required to do so.

Required preservation and free access to creek and major drainage corridors - Drainage corridors will continue to be the major trail corridors within the city, and as such should be developed with access along at least one side of the creek for small drainage tributaries and along both sides of the creek for major creeks such as Oyster Creek, Avalon Levee, and the Brazos River. These corridors are largely unable to be developed and can preserve some of the remaining natural space in Sugar Land. Steps should be taken to require that natural creek corridors be preserved and trail access be allowed. In most cases, streets paralleling the drainage or creek corridor are preferred, rather than lots that back up to the creek and that effectively seal off the creek from public view or access.

Incorrect Model *- Unattractive drainage corridor in the city that could have served as a trail and park corridor. Lots backing up the corridor create a "no-man's land" that serves only to carry storm water.*

Preferred Treatment *- A similar drainage condition on Settlers Way turns a common place drainage channel into a mini-park and green space.*

Trail Maintenance

Effective trail maintenance is critical to the overall success and safety of trails in Sugar Land. Maintenance activities typically include pavement stabilization, landscape maintenance, facility upkeep, sign replacement, mowing, litter removal, and painting. A successful maintenance program requires continuity and often involves a high level of citizen participation. Routine maintenance on a year-round basis will not only improve trail safety, but will also prolong the life of the trail. The benefits of a good maintenance program are far-reaching, including:

A high standard of maintenance is an effective advertisement to promote the trail as a regional and state recreational resource.

Good maintenance can be an effective deterrent to vandalism, litter, and encroachments.

Good maintenance is necessary to preserve positive public relations between the adjacent land owners and managing agency.

Good maintenance can make enforcement of regulations on the trail more efficient. Local clubs and interest groups will take pride in "their" trail and will be more apt to assist in protection of the trail.

A proactive maintenance policy will help improve safety along the trail.

Ongoing trail maintenance likely includes some, if not all, of the following activities:

Vegetation

In general, plantings should be placed far enough apart to maintain good visibility and avoid creating the feeling of an enclosed space. This will also give trail users good, clear views of their surroundings, which enhances the aesthetic experience of the trail. Under-story vegetation within most trail rights-of-way should not be allowed to grow higher than 36 inches, except in cases where the under-story vegetation is natural, desirable, and part of the habitat required for wildlife. Trees species selection and placement should be made that minimizes vegetative litter on the trail and root uplifting of pavement. Vertical clearance along the trail should be periodically checked, and any overhanging branches over the trail should be pruned to a minimum vertical clearance of 10 feet.

Some basic measures should be taken to protect the trail investment. This includes a bi-annual mowing along both sides of the trail to prevent invasion of plants into the pavement area. The recommended times of year for mowing are fall and spring.

Wherever possible, vegetation control should be accomplished by mechanical means or hand labor. Some species may require spot application of state-approved herbicide.

Surfacing

Where concrete is the recommended surface material, cracks, ruts, and water damage will need to repaired periodically.

Where drainage problems exist along the trail, ditches and drainage structures will need to be kept clear of debris to prevent washouts along the trail and maintain positive drainage flow. Checks for erosion along the trail should be made during the wet season, and immediately after any storm that brings flooding to the local area. The use of trails with natural soft surfaces should be minimized and/or prohibited during wet conditions.

The trail surface should be kept free of debris, especially broken glass and other sharp objects, loose gravel, leaves, and stray branches. Trail surfaces should be swept periodically. Soft shoulders should be well maintained to maximize their usability.

Litter and Illegal Dumping

Staff or volunteers should remove litter along the trail. Litter receptacles should be placed at access points such as trailheads.

Illegal dumping should be controlled by vehicle barriers, regulatory signage and fines as much as possible. When it does occur, it should be removed as soon as possible in order to prevent further dumping. Neighborhood volunteers, friends groups, alternative community service crews, and inmate labor should be considered in addition to maintenance staff.

Signage

Signage should be replaced along the trail on an as-needed basis.

"Passion and vision will build future trails, preserve greenspace, and create other community connections and enhancements in our area."

A history of Portland Trails, 2001

Table G-2 Life Cycle Comparison	
Type of Trail Surface	**Projected Trail Replacement Cycle**
Concrete Surface (5" minimum thickness)	15 to 30 year life span with proper base and protection from drainage and vegetation
Asphalt Surface (2" Overlay)	5 to 10 year life span with proper base, but requires considerable patching and periodic rolling. Water penetration can cause quick deterioration
Crushed Granite Surface	2 to 5 year replacement on a continuous basis through replenishment of the crushed granite. Quick repair of eroded areas is critical to slow deterioration of the trail.

Table G - 3 Potential Annual Trail Maintenance Costs		
Maintenance Item	**Frequency**	
Concrete Trail Maintenance		**$12,000**
Pavement Sweeping	Bi-weekly / as needed	
Shoulder and grass mowing / weed control	Weekly / Monthly as needed	
Trash disposal	Weekly / as needed	
Watering	Weekly / as needed	
Plant trimming	Monthly / as needed	
Drainage cleaning	Yearly	
Lighting repair	Yearly	
Furnishing repair	Yearly	
Telephone, Drinking fountain, irrigation repair	Yearly	
Sign replacement	1 - 3 years	
Pruning	1 - 4 years	
Pavement repairs	5 -15 years	
Special maintenance: mud removal, fallen trees, debris, graffiti removal	As needed (assumes average of three time yearly)	
Trail replacement (anticipated)	Concrete 15 to 30 year replacement cycle	
Asphalt Trail Maintenance*		**$20,000**
Debris Removal	Weekly / as needed	
Shoulder and grass mowing / weed control	Weekly / monthly as needed	
Trash disposal	Weekly / as needed	
Watering	Weekly / as needed	
Plant trimming	Monthly / as needed	
Drainage cleaning	Yearly / as needed	
Lighting repair	Yearly	
Furnishing repair	Yearly	
Sign Replacement	1 - 3 years	
Pruning	1 - 4 years	
Surfacing patching / rolling	monthly	
Special maintenance: mud removal, fallen trees, debris, graffiti removal	As needed	
Trail replacement (anticipated)	Asphalt 5 to 10 year replacement cycle	

(*) Asphalt surfacing generallly not recommended

Table G - 3 Continued Potential Annual Trail Maintenance Costs		
Maintenance Item	**Frequency**	
Soft Surface Trail Maintenance	**Annually**	**$30,000**
Debris removal	Weekly / as needed	
Shoulder and grass mowing / weed control	Weekly / monthly as needed	
Trash disposal	Weekly / as needed	
Watering	Weekly / as needed	
Shrub trimming	Monthly / as needed	
Drainage cleaning	Yearly / as needed	
Lighting repair	Yearly	
Furnishing repair	Yearly	
Sign replacement	1 - 3 years	
Pruning	1 - 4 years	
Erosion patching / trail ranking	Monthly	
Special maintenance: mud removal, fallen trees, flood debris	As needed	
Trail material enrichment (anticipated)	Crushed rock 2 to 5 year replacement cycle	
Bridge and Tunnel Inspection	**Annually**	**$25,000**
Trash disposal	Weekly / as needed	
Sweeping / debris removal	Weekly / as needed	
Drainage cleaning	Yearly / as needed	
Lighting repair	Yearly	
Emergency phone repair	Yearly	
Safety Education	**Annually**	**$16,000**
School / adult education programs	$15,000 every year	
Brochures + update	$5,000 every 5 years	
Community Programs	**Annually**	**$50,000**
Community awareness programs	$5,000 per year	
Bicycle events	$5,000 per year	
Trails coordinator	$40,000 per year	

Proposed Trail System

Implementation Timeframe 2007-2027

The overall recommendations of this Trails Master Plan are estimated to take up to 20 years to complete. The following sequence or hierarchy of actions is recommended to implement the Citywide Trails Master Plan.

Consider acquisition of trail corridors as the highest priority - Connectivity across the city remains the highest priority of the trails plan, and to accomplish that access trail corridors must be acquired. Creek corridors can be acquired through outright purchase or through access easements. Once a tract of land is developed, it is extraordinarily difficult to acquire land or easements for trail corridors.

Consider embarking on an extensive trail development schedule over the next 10 years - Sugar Land continues to grow at an unprecedented rate, and demand for quality of life features such as trails will only grow. It is while the city is growing that it becomes the easiest time in which to build trails.

Average the construction of 1 to 2 miles of trails per year for the next 10 years - Maintain a steady funding channel so that trail development can remain a high priority over the next decade.

Develop strategies to work with private sector development - Voluntary and mandatory processes to work with private development should be put in place immediately, so as to not miss any opportunities to implement segments of trail.

Review and Update the Citywide Trails Plan annually - This Citywide Trails Master Plan is a living document, and should be reviewed and updated annually. This review should occur at the same time that the overall Parks, Recreation, and Open Space Master Plan is being reviewed, so that continuity between the two plans is maintained.